

What is claimed is:

1. A method of recovering crude oil from a subterranean hydrocarbon containing formation which comprises (a) injecting into said formation through an injection well an aqueous solution containing an effective amount of one or more alkali(s) along with an effective amount of alkylaryl sulfonate surfactant made by alkylating and sulfonating aromatic compounds and an alpha-olefin stream having a broad distribution in olefin carbon numbers, the olefin stream is the carbon chain C₁₀ bottoms of a commercial ethylene synthesis alpha-olefin reactor and comprises C₁₀₊ through C₃₀₊ carbon chain fractions, and wherein the aromatic compound is selected from the group consisting of benzene, toluene, xylene, ethyl benzene, or mixtures thereof, and then neutralizing the resulting alkylaryl sulfonic acid, and (b) displacing said solution into the formation to recover hydrocarbons from a production well.

2. The method of claim 1 wherein said alkali is one or more selected from the group mono valent hydroxide, mono valent carbonate, mono valent silicate.

3. The method according to claim 1 wherein the alkali is selected from the group sodium hydroxide, sodium carbonate, sodium silicate.

4. The method of claim 1 where the alkali is present in amounts of from about 0.1% by weight to about 3.0% by weight.

5. The method of claim 1 where the alkylaryl sulfonate surfactant is present in amounts from about 0.025% by weight to about 0.5% by weight.

6. The method of claim 1 wherein said alpha-olefin stream is a combination of individual
5 alpha-olefin fractions having a carbon chain of from about C₁₂ to about C₂₈.

7. The method according to claim 1 wherein the aromatic compound is o-xylene, m-xylene, p-xylene or mixtures thereof and wherein the injection wells and production wells are selected from the group consisting of the same well, different wells or
10 combinations thereof.

8. The method of claim 1 wherein alkylation of the aromatic compounds by the alpha-olefin stream having a broad distribution in olefin carbon numbers is conducted with AlCl₃ or HF catalyst.

9. The method of claim 1 wherein alkylation of the aromatic compounds is conducted using the olefin sulfonic acids from the sulfonation of an alpha-olefin stream having a broad distribution in olefin carbon numbers.

10. The method of claim 1 where the neutralization is carried out using NaOH.

11. An alkali and alkylaryl sulfonate surfactant composition for enhanced oil recovery giving the improvement ultra-low interfacial tensions over a wide range of alkali(s)

concentrations, comprising one or more alkali(s) along with an alkylaryl sulfonate wherein the alkyl chain includes C₁₂ to C₃₀₊ carbon chain lengths and wherein the carbon chain is straight, branched or mixtures thereof, and wherein the aryl group is selected from the group benzene, toluene, xylene, ethyl benzene, or mixtures thereof.

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12. The composition of claim 11 wherein said alkali is one or more selected from the group mono valent hydroxide, mono valent carbonate, mono valent silicate.

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13. The composition according to claim 11 wherein the alkali is selected from the group sodium hydroxide, sodium carbonate, sodium silicate.

14. The composition according to claim 11 wherein the aryl group is o-xylene, m-xylene, p-xylene, or mixtures thereof.

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15. The composition of claim 11 where the alkali is present in amounts of from about 0.1% by weight to about 3.0% by weight.

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16. The composition of claim 11 where the alkylaryl sulfonate surfactant is present in amounts from about 0.025% by weight to about 0.5% by weight.

17. The composition of claim 11 wherein said alkyl chain is one having a carbon chain of from about C₁₂ to about C₂₈.